
VICTORIAN ENTOMOLOGIST

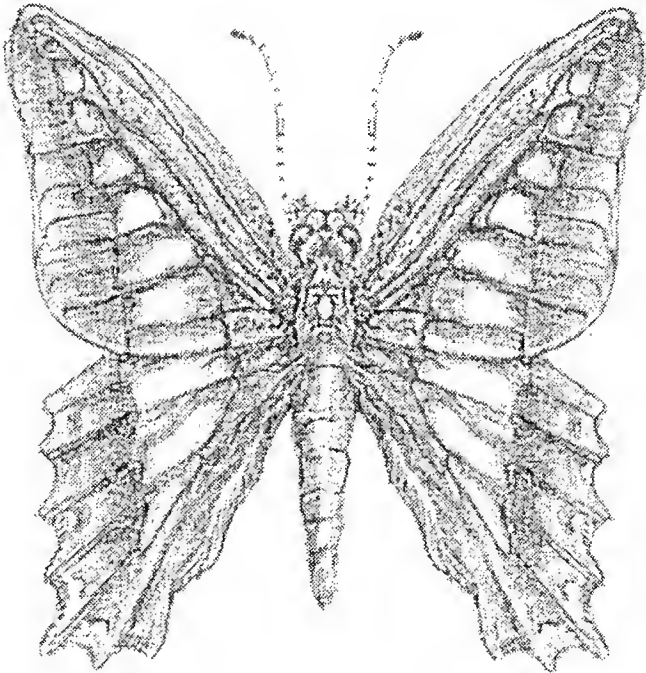


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News Bulletin of The Entomological Society of Victoria Inc.

THE ENTOMOLOGICAL SOCIETY OF VICTORIA (Inc)

MEMBERSHIP

Any person with an interest in entomology shall be eligible for Ordinary membership. Members of the Society include professional, amateur and student entomologists, all of whom receive the Society's News Bulletin, the Victorian Entomologist.

OBJECTIVES

The aims of the Society are:

- (a) to stimulate the scientific study and discussion of all aspects of entomology,
- (b) to gather, disseminate and record knowledge of all identifiable Australian insect species,
- (c) to compile a comprehensive list of all Victorian insect species,
- (d) to bring together in a congenial but scientific atmosphere all persons interested in entomology.

MEETINGS

The Society's meetings are held at La Trobe University, 2nd Floor, Room 2.29, 215 Franklin Street, Melbourne (Opposite the Queen Victoria Market) Melway reference Map 2F B1 at 8 p.m. on the third Friday of even months, with the possible exception of the December meeting which may be held earlier. Lectures by guest speakers or members are a feature of many meetings at which there is ample opportunity for informal discussion between members with similar interests. Forums are also conducted by members on their own particular interest so that others may participate in discussions.

SUBSCRIPTIONS

Ordinary Member	\$20.00 (overseas members \$22)
Country Member	\$16.00 (Over 100 km from GPO Melbourne)
Student Member	\$12.00
Associate Member	\$ 5.00 (No News Bulletin)

Associate Members, resident at the same address as, and being immediate relatives of an ordinary Member, do not automatically receive the Society's publications but in all other respects rank as ordinary Members.

Cover design by Alan Hyman.

Cover illustration of the Blue Triangle butterfly, *Graphium sarpedon* L. by Rhonda Millen.

MINUTES OF THE GENERAL MEETING, 18 AUGUST, 2000

Meeting opened 8.15 pm.

Present: I. Endersby, M. Endersby, D. Dobrosak, D. Stewart, G. Weeks, R. MacPherson, C. Peterson, A. Kellehear, J. Tinetti, P. Carwardine, R. McMahon

Apologies: A. Farnworth, E. Farnworth,

Minutes: Minutes of the general meeting 16/6/00 were accepted. *M: I Endersby; S: R. MacPherson*

Treasurer's Report:

- Account balances are: General account \$5707; Le Souëf account \$3429

Editor's Report:

- Newsletter articles are called for.
- The introduction of the GST has resulted in a small saving on the current issue although postage has risen slightly.

Correspondence:

Items received and tabled:

- Circular 86 of The Society for Insect Studies
- Journal of the Entomology Research Society from Turkey on exchange
- Letter from Earth Repair Foundation with a copy of their charter for display, and a copy of a Forest Protection petition

The Swordgrass Brown Group has acknowledged with pleasure our recent nomination of their group for an award

General Business:

1. A suggestion that the Society send reports of fieldwork conducted to the Friends of the Organ Pipes was referred to council. Reports were sent to the ranger.
2. Suggestions for excursions or film night included a visit to the zoo breeding area [to be held on 25 November - see back page of this issue], a clinic on setting insects and collection trip to the Organ Pipes.

Speaker:

Daniel Dobrosak presented a talk on the 'Life history of Wattle Flower-Feeding Paropsine Beetles'. These were one of the first Australian insects described and he reviewed the work of various entomologists who described them. Daniel has been collecting and recording data about these insects for several years. His own slide and photographic records accompanied an account of his collecting and breeding work that included observations of the feeding habits, the breeding patterns and the life cycle of the beetles. He also discussed preliminary distribution maps and illustrated variation in appearance within the species.

The president thanked the speaker on behalf of the group

Meeting closed 9.55 pm

MINUTES OF THE COUNCIL MEETING, 15 SEPTEMBER, 2000

Meeting opened 8.15 pm

Present: I. Endersby, D. Dobrosak A. Kellehear, J Tinetti, P. Carwardine

Apologics: R MacPherson, D. Stewart,

Minutes: Minutes of the council meeting, 21/7/00, were accepted with the addition of R. MacPherson as an apology. M: A. Kellehear, S: D. Dobrosak

Correspondence:

- The president has replied to Dr Braby and his concerns about contributions to *The Victorian Entomologist*
- Letter from Melrose press requesting members' contact details for use when researching their reference titles. No response will be made.

Treasurer's Report:

- Account balances are: General account \$5585: Le Souëf account \$3429
- Five members subscriptions are outstanding
- The treasurer outlined the way in which Society funds currently generate interest. After discussion the council **recommends:**

That \$3500 from the Society's general A/C be invested at fixed term deposit, and that all interest earned go to the Le Souëf A/C and be used to defray costs associated with that A/C. It is anticipated that this may result in a small surplus.

M: I. Endersby, S: A. Kellehear

Editor's Report:

Significant submissions for next issue have been received.

General Business:

1. Further discussion of postage rate for overseas members. The council **recommends:**
That those members who reside overseas pay an extra \$6 to cover costs of airmail, as surface mail is no longer available from Australia Post.
M: I. Endersby, S: A. Kellehear
2. Suggestion that the Society send fieldwork reports to Friends of the Organ Pipes (referred to council from August general meeting). D. Dobrosak will contact the park ranger to discuss.
3. There was a general discussion about planning for meetings in 2001
4. Organisational details for film night were discussed
5. Newsletter items re Help Wanted box and nominations for Le Souëf award were decided.

Meeting closed 9.15 pm

Butterflies of Southwestern Queensland with New Life History Notes

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Abstract

During a field trip in southwestern Queensland between 28th September and 4th October 1998, observations of 20 species of butterflies were made including several range extensions. Life history notes on several species are recorded.

Introduction

Very few records of the butterfly fauna of southwestern Queensland have been published. For the purpose of this report we define southwestern Queensland as that area south west of an arc which runs from the NSW border northwesterly between St George and Cunnamulla, encompassing Charleville, Quilpie, Windorah and on beyond Bedourie to the NT border. Birdsville provides a southwestern limit. The approximate boundary is indicated on the map in Figure 1. The only previous account of butterflies from within this region was by Woodall (1992) who provided a record of September 1991 observations from locations near Eulo, west of Cunnamulla. Woodall listed 12 species, all also recorded by us. Occasional references to species in this region also occur elsewhere, especially Common and Waterhouse (1981). Peters (1969) makes reference to a specimen of *Hypochrysops byzos* (Lycaenidae) from Cunnamulla in the Australian Museum (labelled N. Geary, October 1944), but this remains unconfirmed. Edwards (1948) provided an annotated list of 43 species observed by him over a twenty year period around Mitchell but we were interested in the area to the south and west of this location.

As part of a field trip we sought to record as many species as possible during a week long traverse which began in St George and progressed through Bollon, Cunnamulla, Charleville, Quilpie, Windorah, Betoota, Birdsville and Bedourie. In most instances we undertook brief roadside surveys of the butterfly fauna at irregular stopping points, usually several locations each day. By deliberately selecting different habitats and occasionally climbing hilltops adjacent to the roads, we attempted to maximise the chances of recording species presence. We provide an annotated listing of 25 species recorded from Southwestern Queensland and where appropriate also indicate life history observations.

Observations

Hesperiidae.

No observations were made of any species of Hesperiidae and so far there have been no records published of butterflies in this family from southwestern Queensland. We had hoped to locate evidence of *Croites* species, particularly in the far southwest, but despite deliberate searching effort we were unsuccessful. Edwards (1948) includes 5 species from Mitchell which appear to be the nearest records to the southwest of Queensland.

Papilionidae.

- Papilio anactus* We recorded this species between St George and Cunnamulla. Common & Waterhouse (1981) recorded the species from Cunnamulla also.
- Papilio aegeus* Recorded by Common & Waterhouse (1981) from Quilpie, it is likely to be in most of the more southerly towns and irrigation areas on introduced citrus plants. We did not record it during this trip, but spent little time in urban settings.
- Papilio demoleus* This species was common at Birdsville where larvae were noted on a fresh growth of *Psoralea graveolens* Domin. (Fabaceae), growing in dry stream lines. Previous Eulo record (Woodall, 1992).

Pieridae.

- Eurema smilax* We noted this species 30 km west of St George and 35 km east of Cunnamulla. Recorded from near Eulo by Woodall (1992).
- Catopsilia pyranthe* This is a species expected to occur in the region (Dunn & Dunn, 1991) and we were a little surprised not to encounter it.
- Elodina parthia* This species was recorded between St George and Cunnamulla. This appears to be a new western record.
- Elodina padusa* Recorded at Quilpie (Baldy Top Lookout), this represents a new record for the species. Previously known from near Eulo (Woodall, 1992).
- Belenois java teutonia* The species was observed throughout the southwest at numerous locations including Cunnamulla, Charleville and Quilpie. Previously known from Eulo also (Woodall, 1992). Juvenile stages were noted on shrubs of *Apophyllum anomalum* F. Muell. (Capparaceae) at several locations.
- Delias aganippe* This species appears to have been recorded from Cunnamulla and Charleville (Dunn & Dunn, 1991) and also near Eulo (Woodall, 1992) but we did not note it.

Nymphalidae.

- Danaus chrysippus* This species was noted at several locations including Cunnamulla, and 100 km west of Charleville. Woodall (1992) recorded it near Eulo.
- Hypolimnas bolina* An apparent record from Charleville (Dunn & Dunn, 1991) but not noted by us.
- Vanessa kershawi* Noted by us 100 km west of Charleville. Also recorded at Eulo by Woodall (1992).
- Vanessa itea* This species was present between St George and Cunnamulla but not seen west of there.
- Junonia villida* Common as far west as Quilpie but not seen beyond there. Also in the Eulo region (Woodall, 1992).
- Acraea andromacha* This species was recorded flying on the Baldy Top Lookout, 5 km west of Quilpie and the observation provides a considerable extension of range.

Lycenidae.

- Ogyris amaryllis* Previously recorded from Cunnamulla, we noted it also at sites north and west as far as 100 km west of Charleville. On most occasions adults were seen flying around mistletoes growing on bullock (east of Cunnamulla) or on various species of wattle (west of Cunnamulla) including Mulga - *Acacia aneura* F. Muell. ex Benth. (Mimosaceae). Recorded by Woodall at Eulo also (1992).
- Ogyris barnardi* Recorded by Common and Waterhouse (1981) from Cunnamulla, we did not make a positive identification.
- Jalmenus icilius* There appear to be few records of *Jalmenus icilius* from southwestern Queensland although Edwards (1948) recorded the species from Mitchell and noted variation in its life history. Peters (1969) also notes a specimen from Cunnamulla (labelled N. Geary, October 1943). We recorded the species abundantly from St George westward through Cunnamulla, Charleville and Quilpie. It was also abundant at Birdsville where we found juvenile stages on several different plants. Most significantly, larvae and pupae were discovered on *Acacia peuce* F. Muell. (Mimosaceae), a relatively rare and distinctive plant species noted from the Birdsville area (12 km north of Birdsville at 25°28.8'S 142°50'E). But numerous larvae and pupae were also present on *Senna artemisioides* (DC.) Randell (Caesalpinaceae).
- Candalides heathi* Previously recorded from Charleville (C&W 1981), we found this species to be widespread from St George, through Cunnamulla, Charleville and Quilpie. At several locations we found adults laying eggs on *Eremophila gilesii* F. Muell. (Myoporaceae), a very common low spreading shrub. This plant is unpalatable to stock and it is possible that the extensive stands present in the region, especially around Cunnamulla and Charleville, account for the abundance of *C. heathi*.
- Theclinesstes miskini* Found from St George through Cunnamulla to Charleville and Quilpie. Not recorded at Birdsville.
- Th. serpentata* Throughout the region including Birdsville and dunefields further west.
- Th. albocincta* Although anticipated (Dunn & Dunn, 1991), this species was not sighted by us.
- Nacaduba biocellata* Widespread in association with wattle trees. Recorded at Eulo (Woodall 1992).
- Lampides boeticus* Widespread throughout the region including Birdsville and dunefields further west. Woodall noted it in the Eulo area (1992).
- Zizina labradus* Recorded throughout the region from St George to 100 km west of Charleville and also 12 km north of Birdsville. Also near Eulo (Woodall, 1992).

Discussion

Seasonal conditions throughout much of the region were generally good and we had expected to record a reasonably full complement of butterfly species. In the Birdsville area grasses were well past their prime and in many areas the ground cover had dried off considerably which may have reduced the prospect of seeing some species. However, of the 25 species known or likely to occur in the southwest, we were able to record 20 species during this short field survey. Of particular interest was the extensive records of *Jalmenus icilius* throughout the

region, including a new food plant record (*Acacia peuce*) from near Birdsville. Given the suitability of the habitat and our observations, it is surprising that the presence of the species has not previously been noted.

References

COMMON, I.F.B. and WATERHOUSE, D.F. 1981 *Butterflies of Australia*, Angus and Robertson, Sydney, 682 pp. 2nd Edition
DUNN, K.L. and DUNN, L.E. 1991 *Review of Australian butterflies: distribution, life history and taxonomy, Parts 1-4*, privately published by the authors, Melb.
EDWARDS, E.O. 1948 Notes on the butterflies of western Queensland, *Australian Zoologist* 11(3):225-232.
PETERS, J.V. 1969 Notes on the distribution of Australian Hesperioidea and Papilionoidea (Lepidoptera), *Australian Zoologist* 15(2):178-184.
WOODALL, P.F. 1991 Some butterflies from south-western Queensland, *Queensland Naturalist* 31(5-6):125-126.

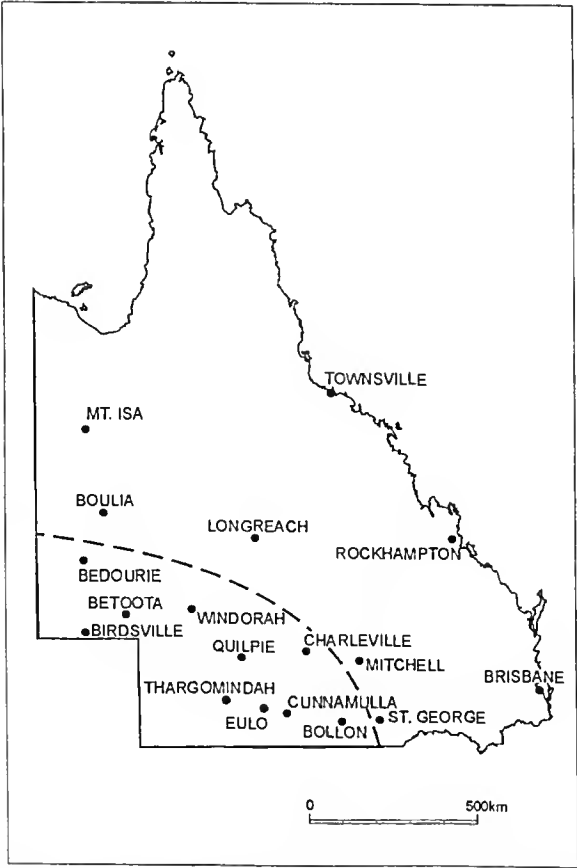


Figure 1. Indicative Boundary and Locations in Southwestern Queensland.

Carrying Pair Behavior and Mating Times in Some Indo-Australian Butterflies and Day-Flying Moths

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Summary: A total of 44 unpublished mating observations are documented based on records kept. Carrying partner details and mating times where recorded are provided for 36 species of Lepidoptera (35 butterflies and one day-moth). All of these except one species occur in the Australian region. The list incorporates 43 personal observations, three of which were made overseas. Most were compiled between 1993-1999. The remaining Australian records were largely derived from literature and are summarised and sourced. A carrying female is speculated as the ancestral state, but as yet there are no records available for the Trapezitinae, an ancient group that needs attention.

Introduction

It is probably stating the obvious to local enthusiasts to mention that there are very few records of carrying partners of Australian Lepidoptera in the literature. Indeed, not only for Australia, but worldwide the topic has been neglected to an extent that Californian workers, Oakley Shields and John Emmel (1973) exclaimed, "There appears to be a kind of prejudice - unspoken - that says this subject is scientifically unimportant." Nevertheless, it has been recognised since 1836 that selection of the carrying partner has broad taxonomic significance (see Shields and Emmel 1973). In their world treatment, these authors provided no records for Australia and very few from the Orient, but included many from other regions. To encourage Australian studies, I have summarised the literature records, and present my own observations (List 1) as a starting point.

Sub-familial Trends

When a mating couple flies, one partner carries the other, either male carries female, female carries male, or they alternate. Shields and Emmel (1973) determined several sub-familial trends. Male carries female in the subfamilies: Coliadinae, Pierinae (one exception) and Danainae. Female carries male in the Hesperinae, Pyrginae, Papilioninae, Parnassiinae, Satyrinae (mostly), Riodininae (only one species reported) and Theclinae. Either male carries female or female carries male in the Acraeinae, Nymphalinae (in favour of female carrying male) and Lycaeninae (in favour of male carrying female). Shields and Emmel also found that if a mating pair is repeatedly disturbed, alternation of the carrying sex occasionally occurs in some species.

General trends from Shield & Emmel's synopsis and those determined from the 44 new observations and several Australian literature records examined (List 2) are summarised and compared in table 2. In view of the apparent World tendency for a carrying female in the hesperiinae, my northern Queensland record of a carrying male in *Suniana sunias* is especially noteworthy. However, so far, only this one observation is available for this whole subfamily in Australia so it may prove exceptional. More importantly, there seems no data available for the subfamily, Trapezitinae, an ancient group endemic to Australia and New Guinea (Atkins 1999). Given the global trend for a female carrier in the family Hesperidae it is anticipated the trapezitines will almost certainly follow suit, particularly given the larger size and heavier abdominal weight of most females in this group. Nonetheless, it is clearly a group for future focus by resident field workers.

Among the Australian polyommata lyaenids it seems either male or female may be the carrying partner (List 2). In the nine pairs of *Zizina labradus* I documented, the ratio of male to female carriers was 2:1 (List 1). Hence, it is possible there is a bias toward male carriers in this

group (or at least in this species), but more observations on this and other polyommatae are needed for a clearer understanding. In Shields and Emmel's synopsis, the polyommatae were incorporated within the Lycaeninae, which limits quick comparison, but it appears from their species list that males are frequent carriers in other World regions. The Theclini were treated at tribal status, fortunately permitting comparison with the Theclinae. Again there is agreement here, albeit my data is inconsequential (a single record). Overall, my field observations and the examined literature on Australian species accord well with the global conclusions of Shields and Emmel.

Relict Mesozoic Fauna distinguished by Female Carriers

In my view, it seems a female carrier is the likely ancient state, and by corollary the male state is derived. Others may argue that perhaps this is merely a practicable adjunct to the evolution of a larger and presumably, physically stronger, female sex in the Lepidoptera. Certainly, Shields and Emmel suggested that in terms of size difference a female carrier seems a logical preference, but in terms of survival a male carrier might be selected for so that in the event of predatory attack the female might escape. Nonetheless, I see that carrying pair behavior could be useful in the study of biogeography and evolution at the higher group levels.

The Australian butterfly fauna at sub-familial and tribal levels contains substantial elements of recent origin from New Guinea, the Pacific and South East Asia (Kitching & Dunn 1999). Kitching and Dunn's species richness isopleths demonstrated radiation in the south east of the continent. This radiation was associated with ancient endemism within the Trapezitinae, southern Satyrinae, and a few tribes of the Lycaenidae. Compared with the mainland, Tasmania is more isolated and contains fewer post-Pleistocene immigrants from the north.

If the female carrier is the pre-ursorial state, it follows that among the Tasmanian relict groups that survived the glaciations, all species might be expected to use female carriers. Indeed, this seems the case. Apart from odd vagrants and a recent introduction, the three confirmed male-carrying groups listed by Shields and Emmel (*ie* the Coliadinae, Pierinae and Danainae) are absent. The common migratory Nymphalinae, members of the Polyommatae (such as *Neolucia*, *Theclinesstes*, *Candalides* etc), and the two Hesperinae probably entered during the Pleistocene land bridge and are not Tasmanian relicts. All of these genera show greater species radiation on the mainland, and may be expected to sometimes use male carriers (Table 2). The remaining Tasmanian species all belong to known or supposed female-carrier groups and are presumably then a relict of the original (Mesozoic/Gondwana) fauna. These groups comprise the Theclinae, Papilioninae, Satyrinae and Trapezitinae. Indeed, at least one genus, *Pseudalmemus* (Theclinae), is historically regarded to be of "very ancient origin" (Couchman & Couchman 1977) having developed subspecies before the Pleistocene epochs. All species that show pre-Pleistocene sub-speciation, now separated by the SE-NW 'Remington' suture (see Dunn 1998b, 1999 for discussion), are confined to these subfamilies. Hence, knowledge of carrying partners may help draw evolutionary conclusions and must be considered a valuable study.

Recognising the Carrier

Shields and Emmel (1973), quoting earlier observers, pointed out that, "determining which sex is carrying is not always an easy matter and not to be hastily attempted." For this reason, some observations are stated as 'undetermined' or 'probable' where I was not convinced the sex determination was beyond doubt. In order to recognise the carrying partner, it is essential to examine the pair at close range and encourage a brief flight if possible. Although usually achieved, a disturbed pair sometimes separated, or sought refuge higher up in foliage. If the latter occurred, the pair was gently netted. Once confined, the carrying adult could usually be recognised, pinioned and sexed as required. An unfortunate trade-off, however, was the

disturbance this often involved. A hasty capture sometimes caused cessation of copulation, terminating further observations.

The stance adopted by resting pairs suggests the likely carrier. Shields and Emmel found that among settled couples the normal carrying partner for the species or group is the uppermost one. Indeed, couples resting on a vertical surface will align themselves on this basis. However, Scheermeyer (1999) discussed an example where because of size difference, a female *Euploea* (Danainae) was forced to carry the male (the usual carrier), but "After she landed the couple turned so that the male assumed the upper position as normal." Vertical alignment provides an easier method of identifying the likely carrier than pinioning netted, flying couples, or repeatedly observing the couple in flight, however on horizontal surfaces the upper adult may not be clear. In Scheermeyer's example the uppermost adult (the male) was not the actual carrier in the instance recorded. Shields and Emmel cited several examples that conflict with the suggestion that size difference or physical condition of adults can determine the carrier. In one remarkable case a female *Colias* (Coliadinae) carried, after the male (the consistent carrier sex in this subfamily) died from attack by a bug or spider. In this paper all carriers were confirmed by forced flight except the Castniid moth which crawled. Assumptions about the usual carrier are derived from this data.

Mating Times

In the general summary (List 2), the time of mating for each observation has been grouped into two-hour, watch periods (Table 1). For Australia, all Eastern Summer Standard Times (daylight saving times) have been converted to Eastern Standard Time and then grouped. Overseas records are at the times in those countries and grouped at face value to the appropriate watch period.

6:01 am – 8:00 am EST	= early morning (EM)
8:01 am – 10:00 am EST	= mid morning (MM)
10:01 am – 12:00 pm EST	= late morning (LM)
12:01 pm – 2:00 pm EST	= early afternoon (EA)
2:01 pm – 4:00 pm EST	= mid afternoon (MA)
4:01 pm – 6:00 pm EST	= late afternoon (LA)

Shield and Emmel (1973) recorded selected species of Polyommatae generally mating from MM to MA. Others of Papilioninae, Nymphalinae, Theclinae and Polyommatae were mostly recorded from MM to EA; members of Satyrinae, Coliadinae and Pierinae from MM to LA; those of Danainae, some Nymphalinae and Theclinae favoured LA, and a member of the Libytheinae at UV light in the evening. They emphasised, however, that many more observations were needed before definitive conclusions could be drawn. Indeed, observations of a *Colias* sp. (Coliadinae) cited by these authors suggest that daily temperatures and weather conditions strongly affect flight activity and, by corollary, the times of mating. Mating times (ie. time of day of encounter - not duration of copulation) for taxa listed in this paper are grouped and compared with these authors' general findings (Table 2). Mating inception times are believed to be non-random, but duration varies with prevailing climate (Shields & Emmel 1973). Given the long period (often several hours in cool weather or even one or more days under alpine conditions) some species can spend in copulation, the times of my encounters may or may not be significant. Hence, the times provided can only be regarded as a general guide based on an unknown starting time. Perhaps in the tropical regions where matings may be quicker the data may be more meaningful. In Table 2, pairings cited in literature sources were (under)-scored as a single record per species, as numbers are not known. In many cases repeated observations were obviously involved (eg. Schcrrmeyer 1999).

Subfamily	E&S 1973: Carrier	This paper: Carrier	E&S 1973: Mating Time	This paper: Mating Time	This paper: Pairs
Pyrginae	F	Not det.	MM-LA	EM	1
Coeliadinac	No data	No data	No data	No data	0
Hesperinae	F	M	MM-MA	MA	1
Trapezitinae	No data	No data	No data	No data	0
Papilioninae	F	F (mostly)	MM-LA	LA	3
Parnassiinae	F	No data	No data	No data	0
Coliadinae	M	M	MM-LA	MA-LA	2
Pierinae	M	M	EM-LA	EA-MA	4
Amathusiinae	No data	No data	No data	No data	0
Danainae	M	M	EM, EA-LA	EA-LA	>8
Satyrinae	F (mostly)	F	EM-LA	EA-MA	>12
Nymphalinae	Either (F bias)	Not det.	MM-LA	EA	1
Acraeinae	Either	No data	No data	No data	0
Lihythcinae	Not det.	No data	Evening	No data	0
Lycacninae	Either (M bias)	No data	MM-MA	No data	0
Theclinae	F	F	MM-EA, LA	LA	1
Polyommatainae	Either (M bias)	Either	MM-MA	MM-MA	18
Riodininae	F	No data	EA-MA	No data	0
Castniidae	No data	M	No data	LM	1

Observations and Results

Below, I present 44 new observations of 26 species of Lepidoptera (List 1). With few exceptions, the majority of pairs were observed in the eastern Australian States of Queensland, New South Wales, Victoria, and Tasmania, during the years 1993-1999 inclusive. Except where stated, all observations are mine, and locality data for each is listed. Australian records in the literature have been included in the final summary (List 2). For the record, I have also included three personal observations from beyond Australia: viz. *Pieris rapae* (Pierinae) in the state of Maryland, USA, *Danaus chrysippus* (Danainae) in Thailand, and a *Chilades* sp. in the Philippines (seemingly the Malayan *C. pandava*). Each of these species except, probably, the Oriental *Chilades* occurs within the Australian region.

Data Conclusions

In general, the new carrying partner details agree well with overseas results (Table 2). The confirmed male carrier for a member of the Australian Hesperinae is the only conflicting data, but is based on a single observation for this group. It is unlikely to be typical of the subfamily in the Australian region. The single record for the Castniidae may be a first for this group. The mating times recorded in this communication supplement those already in the literature, but their general usefulness, given an unknown starting time, is questioned

List 1: Primary Mating Observations with Available Data

Key: carrying partner (CP), male (M), female (F)

- Chaetocneme denitza* Black River near Townsville QLD. 14 Sep.1993, 7am EST. Habitat: residential garden. Settled with wings flat beneath a large *Cassia* leaf; CP=not det. - both sexes in pristine condition so adults not encouraged to fly. In my excitement in finding this rare species, I forgot to document which sex was uppermost. The unexposed mating pair was discovered whilst searching for pierine larvae; it was observed in company with, Terry Woodger.
- Suniana sunias* (ssp. *rectivitta*) The Palmetum, Townsville QLD. 5 Jun.1997, 3:05pm EST, CP=M; Habitat: parkland; pair settled amongst grasses.
- Papilio anactus* Dandenong VIC. 3 Feb.1978. (late afternoon, both sexes in good condition). CP=F; Habitat: residential garden; pair on low foliage about 1m above ground.
- Cressida cressida* Mt Nebo QLD. 13 Jan.1995, 4:30pm EST, CP=M Habitat: open woodland. (M feeding at flowers of *Lantana camara* whilst in copulation).
- Catopsilia pomona* Ollera Creek, north of Townsville, QLD. 5 Feb.1994, 5pm EST, CP=M. Habitat: woodland ecotone near riparian scrub, on low foliage.
- Eurema hecabe* The Palmetum, Townsville, QLD. 5 Jun.1997, 3pm EST, CP=M (fresh M, F possibly a little older). Habitat: parkland; pair settled amongst herbs/grasses.
- Delias argenthona* Scarborough QLD. 20 Jun.1995, 12:30pm EST, CP=M (M average F fresh). Habitat: mangrove ecotone. Settled in tree canopy amongst mangroves, several metres above ground.
- Appias paulina* Mt Warning carpark, NSW. 24 Jan.1994, 1pm (EST) CP=M. Habitat: upland subtropical rainforest, on low foliage overhanging watercourse.
- Pieris rapae* 2 km E of Triabunna TAS. 9 Mar.1996, 4:10pm (ESST) CP=M (M fresh, F wom). Habitat: sheoake woodland, settled on grass.
- Heteronympha merope* Safety Beach VIC. Dec. 1974. CP=F (2 pairs). Habitat: residential garden; both pairs within a metre of each other, sheltering on unexposed leaves within dense foliage beneath overhanging grapevines. (Males good cond; females fresh).
- Heteronympha penelope* (ssp. *penelope* loc.f. *sterope*) Hamilton Reserve, near Dewhurst VIC. 5 Mar.1996, 3:45pm ESST, CP=F (both sexes good cond, M slightly scratched). Habitat: eucalypt-grassy woodland, settled on eucalypt foliage several metres above ground.
- H. penelope* Churchill National Park, VIC. 28 Mar.1996, 4pm ESST, CP=F (F fresh, M medium cond.) Habitat: open forest. When disturbed from the grass where they had previously copulated, the female flew the pair to a tree where they settled 2m above the ground. During earlier repeated disturbances (while the pair were observed on grass), the female carried consistently.
- H. penelope* (ssp. *diemeni*) 14 km SE Campbell Town TAS. 10 Mar.1996, 1:45pm ESST, CP=F (F fresh, M old). Habitat: grassland plain; settled amongst grasses.
- Danaus plexippus* Near Ningi QLD. 23 Jun.1995, 1:30pm EST, CP=M; Habitat: scrubby woodland; first seen in flight, landed on low foliage.
- Danaus chrysippus* (ssp. *petilia*) 4 km N of Port Macquarie NSW. 10 Jan.1995, 3:30pm EST, CP=M. Habitat: coastal heathland, on low foliage.
- D. chrysippus* Weston Creek State Forest, at 3 km SE of park office, QLD. 7 Mar.1994, 4:30pm EST, (2 pairs) CP=M (both). Habitat: open forest, on low foliage.
- Danaus affinis* Perulpa Island, near Brisbane QLD. 17 Apr.1995, 3:30pm-3:45pm EST, (3 pairs obs.; CP=M in all pairs). Habitat: mangrove ecotone; settled on low herbs in filtered sunlight near mangroves.
- Junonia villida* Upper Freestone QLD. 24 Apr.1994, 12:30pm EST, CP = not det. Habitat: woodland.

- Jalmenus evagoras* Mt Nebo QLD. 13 Jan.1995, 5pm EST, CP=F; settled on foliage about 1m above ground near larval host plants. Remained in copulation for at about 5 hours.
- Candalides acasta* The Pines Reserve, Frankston North VIC. 23 Nov.1998, 12:10pm ESST, CP=M (both sexes fresh). Habitat: heathland; on hilltop, settled on low plants near larval host.
- Candalides hyacinthina* (ssp. *hyacinthina*) Churchill National Park VIC. 6 Oct.1995, 12:30pm EST, CP=F (both sexes in good condition). Habitat: open eucalypt forest; on low foliage
- Candalides consimilis* (ssp. *goodingi*) Garfield North VIC. November 1995, ca.12pm ESST, CP=F (obs. by WNB Quick). Habitat: residential garden adjacent open forest; on low foliage.
- C. consimilis* (ssp. *goodingi*) Mortimers Reserve near Gembrook Vic. 8 Dec.1995, 3:50pm ESST, CP=F. Habitat: open forest; settled on low foliage near blackberry nectar source.
- Zizina labradus* Mt Beerburum QLD. 22 Mar.1995, 1pm EST, CP=M
- Z. labradus* The Palmetum, Townsville QLD. 9 Nov.1995, 9am EST, CP=M. Habitat: parkland.
- Z. labradus* Hamilton Reserve near Dewhurst VIC. 3 Mar.1996, 4pm ESST, CP=M, (M worn, F fairly fresh). Habitat: woodland. Settled amongst grasses.
- Z. labradus* Taggerty VIC. 25 Jan.1997, 3pm ESST, CP=F (F Fresh, worn M).
- Z. labradus* Knoxfield VIC. 30 Jan.1997, 12:15pm ESST, CP=M. Habitat: residential garden.
- Z. labradus* Icy Creek VIC. 13 Apr.1997, 12:10pm EST, CP=F (F fresh, M worn).
- Z. labradus* Wandin VIC. 25 Mar.1998, 3:05pm ESST, CP=M. Habitat: woodland.
- Z. labradus* Knoxfield VIC. 25 Jan.1999, 10:10am ESST, CP=F (both sexes fresh). Habitat: residential garden.
- Z. labradus* Knoxfield VIC. 29 Jan.1999, 10:45am ESST, CP=M (M medium F fresh). Habitat: residential garden.
- Theclinesathes onycha* Mt Gammie QLD. 21 Mar.1994, 1pm EST, CP=F. Habitat: woodland.
- Theclinesathes miskini* 6 km ENE of Leyburn QLD. 23 Feb.1994, 3pm EST, CP=F. Habitat: woodland.
- Neolucica agricola* (ssp. *insulana*) Black Bobs Rivulet, c. 2 km SE of Black Bobs TAS. 17 Jan.1996, 3pm ESST, CP=M (M worn and chipped, F fresh) (see Dunn 1998a for details).
- Nacaduba biocellata* Broken Hill, NSW. 1 Mar.1997, 10am CT, CP=M (M condition not recorded, F fresh and still expanding).
- Synemon collecta* Inglewood State Forest, at c. 26 km N of Canning Creek, QLD. 19 Mar.1994, 12pm EST, CP=M (female in fresh condition, M condition not recorded). Male uppermost; female hung limply from male. When disturbed male crawled, but could not be enticed to fly. Habitat: eucalypt-bullock woodland, on tall grasses.

Three extra-Australian records:

- Pieris rapae* Near Emmitsburg, Maryland USA, 11 Oct.1998, CP=M. Habitat: rural land; on low herb foliage in grassy area.
- Danaus chrysippus* (ssp. *chrysippus*) Mae Rim near Chiang Mai, THAILAND. 2 Apr.1999 about 1-2pm, CP=M (both sexes good cond.) Habitat: woodland; settled on low foliage about 1m above ground.
- Chilades* (?)*pandava* Rizal Park, Manila (Luzon, PHILIPPINES) 8 Nov.1999, c.1pm (adults at rest; CP not det. but probably M as this was uppermost) (both sexes good cond.). Habitat: parkland, settled on low foliage near nectar source.

List 2: Species Summary by Subfamily

Taxon	Carrying Partner	Time	Reference
HESPERIIDAE			
Pyrginae			
<i>Chaetocneme denizo</i>	(not det.)	(EM)	
Hesperiinae			
<i>Suniano sunias</i>	(male)	(MA)	
PAPILIONIDAE			
Papilioninae			
<i>Popilio anoctus</i>	(female)	(LA)	
<i>Cressido cressido</i>	(male)	(LA)	(see also Orr 1999)
<i>Troides priomus x Popilio oegeus</i>	(female <i>Troides</i>)	(ex Valentine 1996)	
PIERIDAE			
Coliadinae			
<i>Catopsilia pomona</i>	(male)	(LA)	
<i>Eurema hecabe</i>	(male)	(MA)	
Pierinae			
<i>Delias argenthona</i>	(male)	(EA)	
<i>Appias poulino</i>	(male)	(EA)	
<i>Pieris ropae</i>	(male) (2 pairs)	(MA)	
NYMPHALIDAE			
Satyrinae			
<i>Mycalesis perseus</i>	(female)		(ex Braby & Jones 1994, Moore 1999)
<i>Mycalesis sirius</i>	(female)		(ex Braby & Jones 1994)
<i>Mycalesis terminus</i>	(female)		(ex Braby & Jones 1994, Moore 1999)
<i>Geitoneuro klugii</i>	(female)		(ex Braby & New 1999)
<i>Geitoneuro ocontha</i>	(female)		(ex Braby & New 1999)
<i>Heteronympha merope</i>	(female) (2 pairs)		
<i>Heteronympho penelope</i>	(female) (3 pairs)		
	(third pair prob. female)	(1=EA, 2=MA)	
<i>Hypocysto metirius</i>	(female)		(ex Braby & Jones 1994)
<i>Ypthima arcotus</i>	(female)		(ex Braby & Jones 1994)
Nymphalinae			
<i>Junonia villido</i>	(not det.)	(EA)	
Danaidnae			
<i>Danous plexippus</i>	(male)	(EA)	
<i>Danaus chrysippus</i>	(male) (4 pairs)	(1=EA, 1=MA, 2=LA)	
<i>Danaus affinis</i>	(male) (3 pairs)	(all MA)	
<i>Euploeo core</i>	(normally male, but female will carry if male unable)		(ex Scheermeyer 1999)
LYCAENIDAE			
Theclinae:			
<i>Jalmenus evagoras</i>	(female)	(LA)	

Polyommatinae:

<i>Candalides acasta</i>	(male)	(EA)
<i>Candalides hyacinthina</i>	(female)	(EA)
<i>Candalides consimilis</i>	(female) (2 pairs)	(1=LM, 1MA)
<i>Theclinesstes onycha</i>	(female)	(EA)
<i>Theclinesstes miskini</i>	(female)	(MA)
<i>Zizina labradus</i>	(male: 6 pairs) (female: 3 pairs)	(1=MM, 3=LM, 3=EA, 2=MA)
<i>Nacaduba biacellata</i>	(male)	(MM)
<i>Nealucia agricola</i>	(male)	(EA) (earlier cited in Dunn 1998a)
<i>Chilades</i> sp. (?) <i>pandava</i>	(possibly male)	(EA)

CASTNIIDAE

<i>Synemon collecta</i>	(male)	(LM)
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Acknowledgements

Thanks to Nigel Quick for allowing me to include an observation of his.

References

- Atkins, A. 1999. The skippers, Trapezites (Hesperiidae). *Monographs on Australian Lepidoptera* 6: 75-104
- Braby, M.F. and Jones, R.E. 1994. Effect of temperature and hostplants on survival, development and body size in three tropical satyrine butterflies from north-eastern Australia. *Aust. J. Zool.* 42: 195-213
- Braby, M.F. and New, T.R. 1999. The Xenicas, *Geitoneura klugii* and *G. acantha* (Nymphalidae: Satyrinae). *Monographs on Australian Lepidoptera* 6: 227-238
- Couchman, L.E. & Couchman, R. 1977. The butterflies of Tasmania. *Tasmanian Year Book* 11: 66-96
- Dunn, K.L. 1998a. Butterfly watching in Tasmania - Part I. *Victorian Ent.* 28: 33-39
- Dunn, K.L. 1998b. Butterfly watching in Tasmania - Part II. *Victorian Ent.* 28: 44-49
- Dunn, K.L. 1999. Butterfly watching in Tasmania - Part V. *Victorian Ent.* 29: 33-39
- Kitching, R.L. & Dunn, K.L. 1999. The biogeography of Australian butterflies. *Monographs on Australian Lepidoptera* 6: 53-74
- Moore, G.J. 1999. The Bushbrowns, *Mycalesis* species (Nymphalidae: Satyrinae). *Monographs on Australian Lepidoptera* 6: 217-226
- Orr, A.G. 1999. The Big Greasy, *Cressida cressida* (Papilionidae). *Monographs on Australian Lepidoptera* 6: 115-134
- Scheermeyer, E. 1999. The Crows, *Euploea* species, with notes on the Blue Tiger, *Tirumala hamata* (Nymphalidae: Danainae). *Monographs on Australian Lepidoptera* 6: 191-216
- Shields, O. and Emmel, J.F. 1973. A review of carrying pair behavior and mating times in butterflies. *J. Res. Lep.* 12: 25-64
- Valentine, P. 1996. Some interesting observations in northern Queensland. *Victorian Ent.* 26: 77

Australian Journal of Entomology Volume 39, Part 3, 2000

The Australian Entomological Society publishes the *Australian Journal of Entomology* quarterly. The Entomological Society of Victoria is an affiliated society and will, in future, publish the contents of the Journal for the wider interest of its members.

SYSTEMATICS

MJ Fletcher: A new genus, *Mayawa*, for the reception of *Limotettix capitatus* Kirkaldy (Hemiptera: Cicadellidae: Deltocephalinae) and descriptions of five new species.

KJ Finlay: Description and distribution of a new species of *Nousia* Navás (Ephemeroptera: Leptophlebiidae: Atalophlebiinae) from southeastern Australia.

H Brailovsky & E Barrera: *Panstronhygia*, a new genus of Colpurini from Sulawesi, with a description of two new species (Hemiptera: Coreidae).

D Hales, ACC Wilson, JM Spence & RL Blackman: Confirmation that *Myzus antirrhini* (Macchiati) (Hemiptera: Aphididae) occurs in Australia, using morphometrics, microsatellite typing and analysis of novel karyotypes by fluorescence *in situ* hybridisation.

LA Mound & DC Morris: Inquilines or kleptoparasites? New phlaeothripine Thysanoptera associated with domicile-building thrips on *Acacia* trees.

PS Cranston: Monsoonal tropical *Tanytarsus* van der Wulp (Diptera: Chironomidae) reviewed: New species, life histories and significance as aquatic environmental indicators.

PJ Gullan: Identification of the immature instars of mealybugs (Hemiptera: Pseudococcidae) found on citrus in Australia.

MORPHOLOGY

JA McBride, CE Bach & GK Walker: Developmental changes in the caudal and lateral processes of larvae of *Aspidomorpha deusta* (Fabricius) (Coleoptera: Chrysomelidae: Cassidinae).

BJ Sinclair: Immature stages of Australian *Austrorhama* Tonnoir and *Niphia* Theisshinger (Diptera: Thaumaleidae)

BIOGEOGRAPHY

RW Matthews, MAD Goodisman, AD Austin & R Bashford: The introduced English wasp *Vespula vulgaris* (L.) (Hymenoptera: Vespidae) newly recorded invading native forest in Tasmania.

ECOLOGY

DG James & B Vogle: Development and survivorship of *Carpophilus hemipterus* (L.), *Carpophilus mutilatus* Erichson and *Carpophilus humeralis* (F.) (Coleoptera: Nitidulidae) over a range of constant temperatures.

BEHAVIOUR AND PHYSIOLOGY

GM Gurr & HI Nicol: Effect of food on longevity of adults of *Trichogramma carverae* Oatman & Pinto and *Trichogramma nr brassicae* Bezdenko (Hymenoptera: Trichogrammatidae)

OL Kvedaras, PC Gregg & AP Del Socorro: Techniques used to determine the mating behaviour of *Helicoverpa armigera* (Hübner) (Lepidoptera: Noctuidae) in relation to host plants.

G Dalby-Ball & A Meats: Influence of the odour of fruit, yeast and cue-ture on the flight activity of the Queensland fruit fly, *Bactrocera tryoni* (Froggatt) (Diptera: Tephritidae)

G Dalby-Ball & A Meats: Effects of fruit abundance within a tree canopy on the behaviour of wild and cultured Queensland fruit flies, *Bactrocera tryoni* (Froggatt) (Diptera: Tephritidae)

PEST MANAGEMENT

D-L Ma, G Gordh & MP Zalucki: Survival and development of *Helicoverpa armigera* (Hübner) (Lepidoptera: Noctuidae) on neem (*Azadirachta indica* A. Juss.) leaves.

PA Ryan & BH Kay: Emergence trapping of mosquitoes (Diptera: Culicidae) in brackish forest habitats in Maroochy Shire, south-east Queensland, Australia, and a management option for *Verrallina funerea* (Theobald) and *Aedes procox* (Skuse).

BIOLOGICAL CONTROL

M Coombs & DPA Sands: Establishment in Australia of *Trichopoda giacomellii* (Blanchard) (Diptera: Tachinidae), a biological control agent for *Nezara viridula* (L.) (Hemiptera: Pentatomidae).

RECENT ARTICLES OF INTEREST

Compiled by Ian Faithfull

Heliiothis moth hits vegetable growers, Fiona Myers, *Weekly Times*, 17 May 2000 p.77. A "one-in-10 year infestation" of *Helicoverpa punctigera* and *H. armigera* in the Riverina caused damage to lettuce crops and seedling tomatoes, and some sweet corn crops written off. Damage exacerbated by low levels of beneficial insects predatory on heliothis larvae.

Locust threat to Mallee crops, Simone Dalton, *Weekly Times*, 31 May 2000, p.9; **Warning on mouse, locust plagues**, Fiona Myers, *WT*, 28 June, p.22; **Locusts wing in trouble**, Monica Jackson, *WT*, 16 Aug. p.72. Locusts caused major damage to some northern Mallee wheat crops in May, in possibly Victoria's worst plague since the 1980s. Many locusts had already laid eggs. Isolated patches of locusts were present in the NSW Riverina and large numbers in South Australia in June.

Controlling bridal creeper. *Bairnsdale Advertiser*, 9 June 2000. The bridal creeper leafhopper, *Zygina* sp., a biocontrol agent for the weed *Asparagus asparagoides*, was released at five localities along the coast in the Gippsland Lakes area by Emma Wills of the Keith Turnbull Research Institute of NRE. Further distribution will occur by harvesting from sites where the insect establishes. [E.Wills]

Armies on the move. *Frankston Standard*, 26 June 2000, p.25. Simon Dixon of Exopest blames sudden change in the weather (flooding of nests, lack of usual food sources) for invasion of buildings by ants with a 50% rise in calls in the two weeks to late June. Most complaints relate to white-footed house ants, *Technomyrmex albipes*.

Trap catch solved. *Weekly Times*, 2 Aug. 2000, p.93. The 3 month shelf-life of the chemical lure for LuciTrap, a sheep blowfly trap developed for the wool industry, has been extended to 12 months by keeping the three key ingredients in separate bottles. Large scale field trials by the Queensland Dept of Primary Industries have shown that the trap can achieve drastic reductions in the number of flies.

Table grape import ban call, Paul Sellars, *Weekly Times*, 9 Aug. 2000, p.4; **Serious threat in table grape import plan**, Paul Sellars, *WT*, 9 Aug., p.15; **Red alert on vine killer**, Paul Sellars, *WT*, 16 Aug., p.10. Pierce's disease, caused by the bacterium *Xylella fastidiosa*, prevents a range of plants, including grapes, from fruiting and kills within 3 years. It is an extremely serious disease in the USA where the glassy-winged sharpshooter (a species of leafhopper) is the vector. Horticulture industry leaders are calling on the Federal Government for a ban on imports of produce (particularly grapes) from California which could introduce the disease to Australia. Industry spokespeople want assurance that the insect is killed by the compulsory methyl bromide fumigations for such imported fruit. Institute for Horticultural Development (NRE) researchers have developed a rapid detection test for the disease.

Thanks to Emma Wills for contributing material.

Readers are invited to forward items suitable for inclusion in "Recent Articles of Interest" to the compiler at 2 Jacana Drive, Carrum Downs, Vic. 3201.

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DIARY OF COMING EVENTS

Friday 20 October General Meeting

Film/Video Night on an entomological theme at 215 Franklin Street, Melbourne

At the Society's meeting room at La Trobe University, 2nd Floor, Room 2.29, 215 Franklin Street, Melbourne (Opposite the Queen Victoria Market near Queen Street)
Melway reference Map 2F B1

Friday 20 October General Meeting

Film/Video Night on an entomological theme at 215 Franklin Street, Melbourne

Friday 17 November Council Meeting

Saturday 25 November Excursion

A 'behind the scenes' Excursion to Melbourne Zoo's Butterfly House
(Elliot Ave, Parville Melways Map 29 F2)

Meet 10 AM at the entrance to the Butterfly House.

Admission to the Zoo is \$16.60 adult, \$12.20 concession

Friday 8 December General Meeting - Members Night

Members will give short talks and slide presentations.

Please bring a plate. Tea and Coffee will be provided

Scientific names contained in this document are *not* intended for permanent scientific record, and are not published for the purposes of nomenclature within the meaning of the *International Code of Zoological Nomenclature*, Article 8(b). Contributions may be refereed, and authors alone are responsible for the views expressed.